Docket No.: 0033-1008PUS1
(Patent)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| Patent Application of: | Yasushi TAKANO et al. | | |
| Application No.: | 10/540,004 | Confirmation No.: | 8050 |
| Filed: | June 21, 2005 | Art Unit: | 1793 |
| For: | FLAKE PIGMENT, PAINT AND POWDER PAINT CONTAINING THE SAME AND FINISHING AGENT FOR FLAKE PARTICLES EMPLOYED THEREFOR | Examiner: | S. Abu Ali |

**DECLARATION UNDER 37 CFR 1.132**

**MS AMENDMENT**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Yoshiki HASHIZUME, declare and say as follows:

I graduated from Kyoto University, Faculty of Engineering, in March 1975. Since April 1976, I have been employed by Toyo Aluminium Kabushiki Kaisha, engaged in research and development of aluminum materials (aluminum paste, aluminum powder, aluminum nitride powder, etc.). Currently, I am a Manager, Research & Development Dept., Core Technology Center.

I am familiar with U.S. Application Serial No. 10/540,004 of which I am a co-inventor. I have reviewed all Office Actions issued in connection with this application. I have also reviewed all of the references cited by the Examiner in these Office Actions.

**The Present Invention**

The present invention is directed to a flake pigment provided with a coating made of a resin composition containing a copolymer comprising a bond unit from a fluoric polymerizable monomer having alkyl fluoride groups and a bond unit arriving from a polymerizable monomer having phosphate groups. The flake pigment is used in paint for providing the paint with high brightness. Thus, the flake pigment of the present invention is useable in a powder paint for supplying a film with excellent metallic properties, high brightness and excellent secondary adhesiveness.

As recited in the claims of the present application, the flake particles are provided with a single-layer or double-layer coat which covers the surface of the flake particles wherein at least one layer of said single-layer or double-layer coat is made of a resin composition containing a copolymer comprising a bond unit arising from a fluoric polymerizable monomer having alkyl fluoride groups and a bond unit arising from a polymerizable monomer having phosphate groups, said copolymer being soluble in a solvent due to its molecular structure and wherein all of the alkyl fluoride groups and all of the phosphate groups are present in separate side chains of the copolymer. Thus, since all of the alkyl fluoride groups and all of the phosphate groups are contained in different bond units, respectively, they are present in independent respective side chains in the copolymer.

**The Prior Art of Record**

The Miyazaki US 4,931,505 reference defines a copolymer (B) comprising a phosphoric acid ester group and fluorine. However, the Miyazaki reference describes in Col. 6, line 67 to Col. 7, line 5, the following content relating to copolymer (B): "It is considered that when the coating layer is in a dried state, it presents a water repellent surface by virtue of the polyfluorocarbon chain, but when exposed with a large amount of water, the polyfluorocarbon chain withdraws from the surface and the hydrophilic groups transfer to the surface, whereby the surface becomes hydrophilic." Therefore, in the copolymer (B) of the Miyazaki reference, as the "hydrophilic group" or the "polyfluorocarbon chain" reversibly transfers to or withdraws from the surface of the coating layer, in accordance with an environment, the copolymer (B) of the Miyazaki reference is present in such a state that it is not adsorbed to other substances. Hence, if the metallic pigment is coated with the copolymer (B) of the Miyazaki reference, the copolymer (B) will not be adsorbed to the metallic pigment.

In contrast, since the specific resin of the Yukawa reference US 6,617,409, is characterized by an excellent adsorption property to the surface of the metallic pigment, there would be no motivation to replace the resin of the Yukawa reference with the copolymer (B) of the Miyazaki reference. Therefore, since it would not be obvious to combine the teachings of the Yukawa and Miyazaki references, the Examiner can only bridge this gap by referring to the Applicants' own disclosure.

## Advantageous Results of the Present Invention

The advantageous results of the present invention can be observed by referring to Table 1 and Table 2 on pages 34 and 39, respectively, of the present application, the contents of which are incorporated herein by reference.

The effects of the copolymer shown in the present invention are obvious from the aforementioned results of Examples 6 to 10 and comparative example 3, and it is understood that aluminum particles coated with this copolymer can form a powder-coated film having remarkably excellent brightness. Further, a secondary adhesion failure caused when utilizing alkyl fluoride groups is also overcome.

As obvious from the results of Examples 11 and 12 and comparative examples 5 and 6, it is understood that the fluoric polymerizable monomer having alkyl fluoride groups and the polymerizable monomer having phosphate groups are essential ingredients for completing the present invention. In comparative example 3, a filtrate filtrating slurry was whitened and hence it was recognized that the finishing agent was not adsorbed to the aluminum particles. In other words, the monomer unit having phosphate groups conceivably functions as an adsorption site. The polymerizable monomer unit having alkyl fluoride groups causes leafing of the aluminum pigment due to strong water repellency thereof and develops high brightness of the film.

As obvious from the results of Examples 13 and 14, the fluoric polymerizable monomer having alkyl fluoride groups for completing the present invention is independent of the chain length of the alkyl fluoride groups. Further, at least one polymerizable monomer other than the fluoric polymerizable monomer having alkyl fluoride groups and the polymerizable monomer having phosphate groups is not restricted to a specific monomer.

As obvious from the results of Examples 15, 16 and 17, the copolymer according to the present invention is independent of the surface state of a treated object. In the category of the powder paint, the effects thereof appear regardless of the difference between the dry blend mode and the bonded mode. A fluororesin-coated product attaining high brightness is remarkably inferior in secondary adhesiveness.

Accordingly, it is my opinion that the evidence provided in the present application and the arguments presented as to why it would not be obvious to combine the references as suggested by the Examiner, defines an invention contribution not recognized in the prior art.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Yoshiki Hashizume
Signature

Yoshiki HASHIZUME
Typed or Printed Name

June 11, 2010
Date